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Supplementary Material

Article Title: Economic Burden of Commercially Insured Patients With Major Depressive Disorder and Acute Suicidal Ideation or Behavior in the United States

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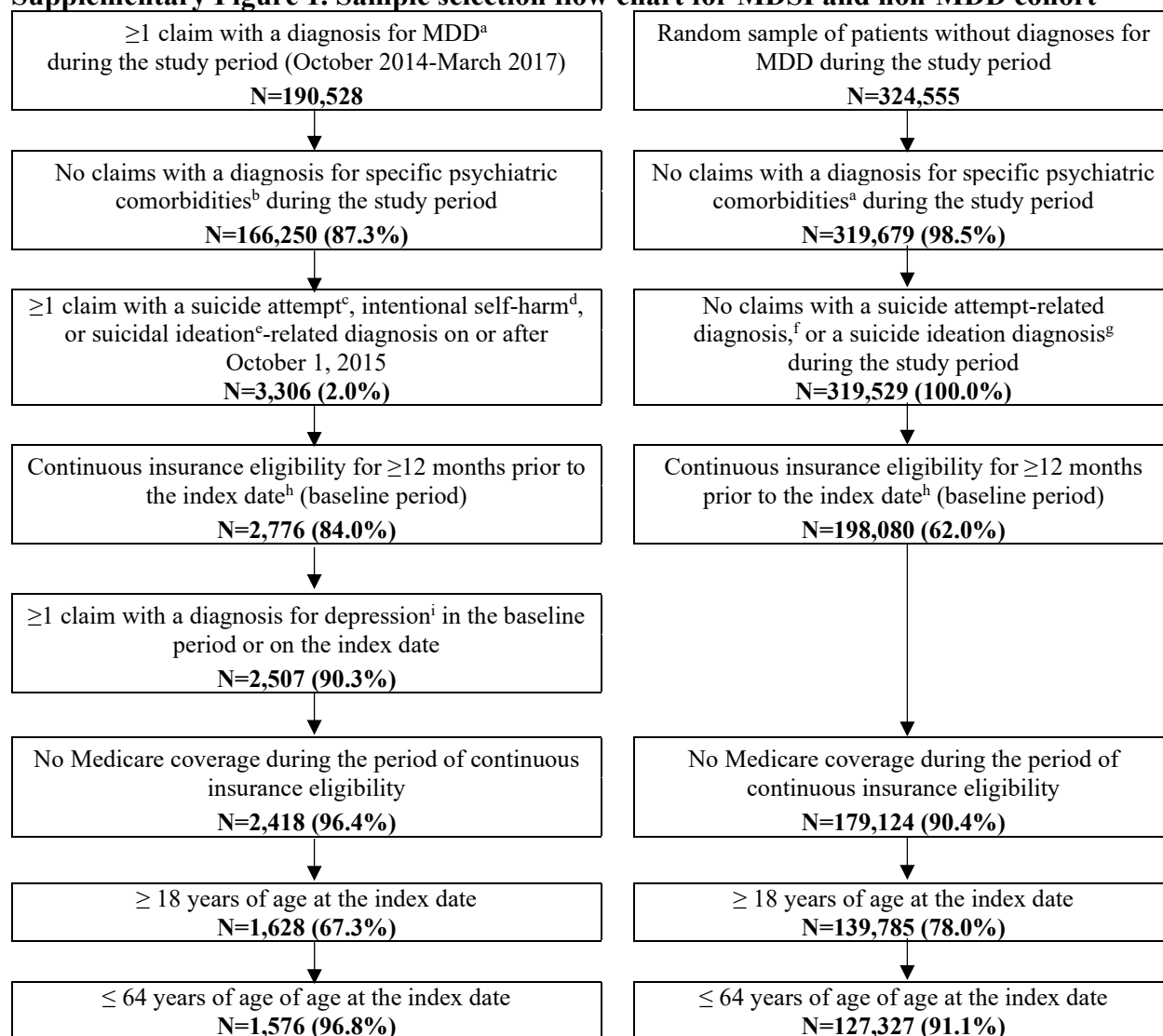
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Supplementary Figure 1. Sample selection flow chart for MDSI and non-MDD cohort



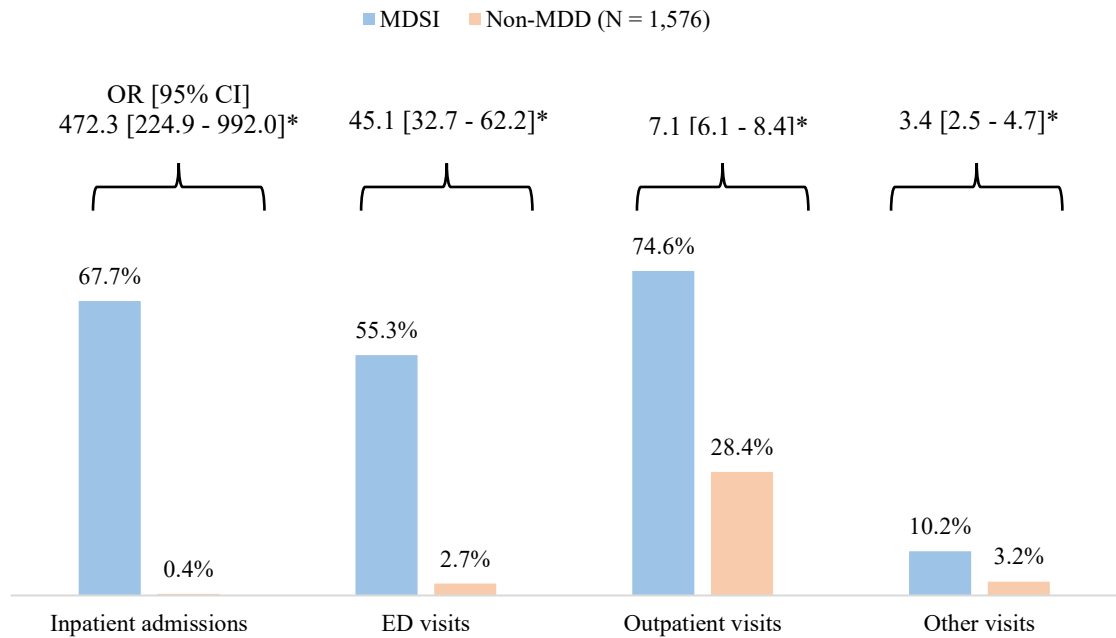
Abbreviations: ICD-9-CM/ICD-10-CM = International Classification of Disease, Ninth/Tenth Revision, Clinical Modification; MDD = major depressive disorder; MDSI = major depressive disorder with acute suicidal ideation or behavior.

Notes:

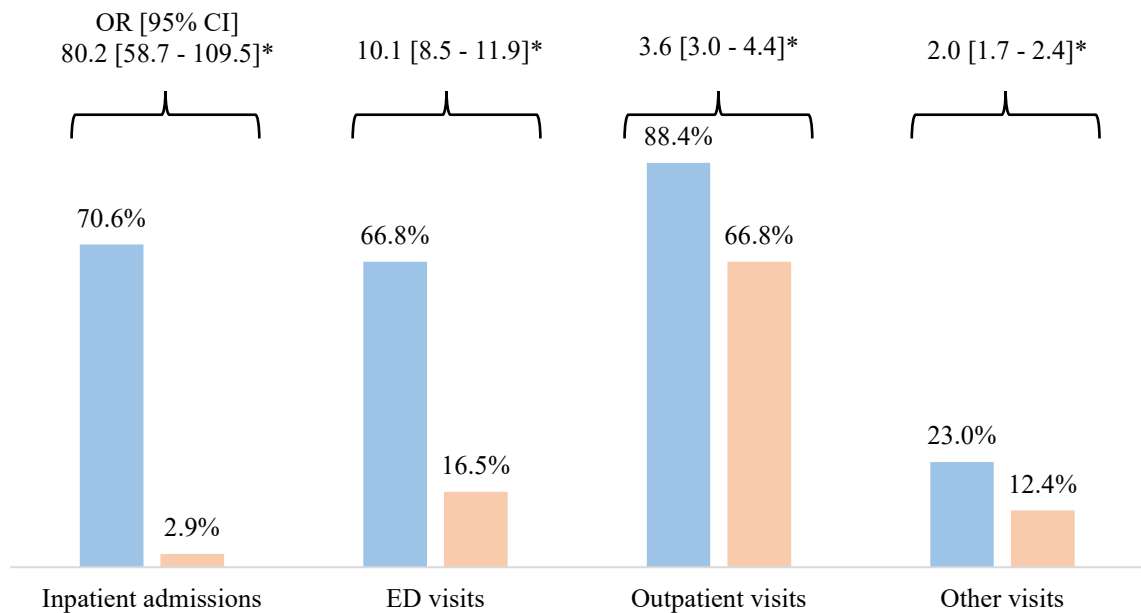
- MDD was identified using ICD-9-CM codes 296.2x, 296.3x and ICD-10-CM codes F32.xx (excluding F32.8), F33.xx (excluding F33.8)
- See Table S1 for the list of codes for specific psychiatric comorbidities.
- See Table 1 for the list of codes used to identify suicide attempt.
- See Table 1 for the list of codes used to identify intentional self-harm.
- See Table 1 for the list of codes used to identify suicide ideation.
- Suicide attempt-related diagnosis defined as any ICD-10-CM diagnosis code for a suicide attempt or intentional self-harm in Table 1, as well as any ICD-9-CM code for suicide or self-inflicted injury (ICD-9-CM: E95x.x [excluding E959.x]).
- Suicide ideation defined as a suicidal ideation diagnosis (ICD-9-CM: V62.84; ICD-10-CM: R45.851)
- For the MDSI cohort, the index date was defined as the date of the first suicidality. For the non-MDD cohort, the index date was randomly generated to mimic the distribution of time from the study period start to the first suicidality among the MDSI patients.
- Depression defined as ICD-9-CM: 296.2x, 296.3x, 300.4x, 311.xx, 309.0x, 309.1x; ICD-10-CM: F32.xx, F33.xx, F34.1x, F43.21.

Supplementary Figure 2. Patients with all-cause medical services in matched cohorts^a (A) ≤ 1 month after index date and (B) ≤ 12 months after index date^b

A



B



Abbreviations: CI = confidence interval; ED = emergency department; MDD = major depressive disorder; MDSI = major depressive disorder with acute suicidal ideation or behavior; OR = odds ratio

Notes:

*: indicates $p < 0.001$

- Patients were matched on age, sex, year of the index date, geographical region, type of healthcare plan, relationship to healthcare plan holder and Quan-CCI.
- ORs, 95% CIs, and p-values were estimated using adjusted logistic regressions. Total costs in the baseline period were used as the covariate in adjusted models.

Supplementary Table 1: List of diagnosis codes used to identify psychiatric comorbidities used for exclusion

Selection Criteria	ICD-9-CM Diagnosis Codes	ICD-10-CM Diagnosis Codes
Bipolar disorder and related conditions	296.0x, 296.1x, 296.4x, 296.5x, 296.6x, 296.7x, 296.8x, 301.13	F30.xx, F31.xx, F34.0, F06.31, F06.32, F06.33, F06.34,
Cluster B personality disorder	301.3x, 301.5x, 301.59, 301.7x, 301.81, 301.83	F60.2x, F60.3x, F60.4x, F60.81
Dementia	290.xx, 294.1x, 331.0x, 331.1x, 331.2x	F01.xx, F02.xx, F03.xx, G30.xx, G31.0x, G31.1x
Intellectual disability	317.xx, 318.xx, 319.xx	F70.xx, F71.xx, F72.xx, F73.xx, F78.xx, F79.xx
Schizophrenia and other non-mood psychotic disorders	293.81, 293.82, 295.xx, 297.xx, 298.1x, 298.3x, 298.4x, 298.8x, 298.9x, 301.22	F06.0x, F06.2x, F20.xx, F21.xx, F22.xx, F23.xx, F24.xx, F25.xx, F28.xx, F29.xx
Substance-induced mood disorder	291.89, 291.9x, 292.84, 292.9x	F10.14, F10.24, F10.94, F11.14, F11.24, F11.94, F13.14, F13.19, F13.94, F14.14, F14.24, F14.94, F15.14, F15.24, F15.94, F16.14, F16.24, F16.94, F18.14, F18.24, F18.94, F19.14, F19.24, F19.94

Abbreviations: ICD-9-CM = International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM = International Classification of Diseases, Tenth Revision, Clinical Modification.

Supplementary Table 2. Behavioral and mental health-related and depression-related healthcare resource utilization

HRU per patient per month	≤1 month post-index		≤12 months post-index	
	MDSI cohort (N = 1,576)	Non-MDD cohort (N=1,576)	MDSI cohort (N = 1,576)	Non-MDD cohort (N=1,576)
Behavioral and mental health-related^a resource utilization				
Inpatient admissions				
Had ≥ 1 inpatient admission, n (%)	1,052 (66.8)	0 (0.0)	1,081 (68.6)	2 (0.1)
Number of admissions, mean ± SD [median]	0.85 ± 1.15 [1.00]	0.00 ± 0.00 [0.00]	0.27 ± 0.95 [0.09]	0.00 ± 0.00 [0.00]
Number of days, mean ± SD [median]	4.31 ± 5.38 [4.00]	0.00 ± 0.00 [0.00]	1.31 ± 2.97 [0.47]	0.00 ± 0.06 [0.00]
ED visits				
Had ≥ 1 ED visit, n (%)	793 (50.3)	0 (0.0)	862 (54.7)	5 (0.3)
Number of ED visits, mean ± SD [median]	0.60 ± 0.77 [1.00]	0.00 ± 0.00 [0.00]	0.20 ± 0.54 [0.08]	0.00 ± 0.01 [0.00]
Outpatient visits				
Had ≥ 1 visit, n (%)	1,019 (64.7)	34 (2.2)	1,209 (76.7)	120 (7.6)
Number of visits, mean ± SD [median]	2.16 ± 3.06 [1.00]	0.04 ± 0.33 [0.00]	1.30 ± 2.36 [0.60]	0.05 ± 0.54 [0.00]
Other visits				
Had ≥ 1 visit, n (%)	116 (7.4)	0 (0.0)	180 (11.4)	4 (0.3)
Number of visits, mean ± SD [median]	0.25 ± 1.54 [0.00]	0.00 ± 0.00 [0.00]	0.11 ± 0.70 [0.00]	0.00 ± 0.01 [0.00]
Depression-related^b resource utilization				
Inpatient admissions				
Had ≥ 1 inpatient admission, n (%)	1,004 (63.7)	0 (0.0)	1,029 (65.3)	0 (0.0)
Number of admissions, mean ± SD [median]	0.80 ± 1.12 [1.00]	0.00 ± 0.00 [0.00]	0.25 ± 0.92 [0.08]	0.00 ± 0.00 [0.00]
Number of days, mean ± SD [median]	4.11 ± 5.32 [3.00]	0.00 ± 0.00 [0.00]	1.22 ± 2.91 [0.41]	0.00 ± 0.00 [0.00]
ED visits				
Had ≥ 1 ED visit, n (%)	700 (44.4)	0 (0.0)	732 (46.4)	0 (0.0)
Number of ED visits, mean ± SD [median]	0.52 ± 0.73 [0.00]	0.00 ± 0.00 [0.00]	0.16 ± 0.53 [0.00]	0.00 ± 0.00 [0.00]
Outpatient visits				
Had ≥ 1 visit, n (%)	808 (51.3)	2 (0.1)	996 (63.2)	9 (0.6)
Number of visits, mean ± SD [median]	1.51 ± 2.61 [1.00]	0.00 ± 0.13 [0.00]	0.88 ± 2.08 [0.25]	0.00 ± 0.03 [0.00]
Other visits				
Had ≥ 1 visit, n (%)	78 (4.9)	0 (0.0)	100 (6.3)	0 (0.0)
Number of visits, mean ± SD [median]	0.14 ± 0.94 [0.00]	0.00 ± 0.00 [0.00]	0.06 ± 0.53 [0.00]	0.00 ± 0.00 [0.00]

Abbreviations: ED = emergency department; HRU = healthcare resource utilization; MDD = major depressive disorder; MDSI = major depressive disorder with acute suicidal ideation or behavior; SD = standard deviation

Notes:

- Behavioral and mental health-related HRU were identified based on claims with an ICD-10-CM diagnosis between F01 and F99 (inclusive).
- Depression-related HRU were identified based on claims with an ICD-10-CM diagnosis codes: F32.xx, F33.xx, F34.1x, F43.21.

Supplementary Table 3. Behavioral and mental health-related and depression-related healthcare costs

Healthcare cost (US \$2017) per patient per month, mean ± SD [median]	≤1 month post-index		≤12 months post-index	
	MDSI cohort (N = 1,576)	Non-MDD cohort (N=1,576)	MDSI cohort (N = 1,576)	Non-MDD cohort (N=1,576)
Behavioral and mental health-related pharmacy and medical costs^a	5,622 ± 8,504 [3,408]	14 ± 314 [0]	1,786 ± 5,064 [689]	11 ± 139 [0]
Psychiatric pharmacy costs^b	54 ± 183 [0]	4 ± 36 [0]	46 ± 119 [2]	4 ± 29 [0]
Behavioral and mental health-related medical costs	5,568 ± 8,485 [3,371]	10 ± 312 [0]	1,739 ± 5,061 [630]	7 ± 136 [0]
Inpatient costs	3,667 ± 7,368 [1,408]	0 ± 0 [0]	1,061 ± 4,260 [226]	0 ± 1 [0]
ED costs	998 ± 2,106 [0]	0 ± 0 [0]	280 ± 1,117 [4]	0 ± 8 [0]
Outpatient costs	657 ± 2,121 [75]	10 ± 312 [0]	307 ± 1,733 [43]	6 ± 133 [0]
Other costs	246 ± 2,107 [0]	0 ± 0 [0]	91 ± 702 [0]	0 ± 3 [0]
Depression-related pharmacy and medical costs	4,455 ± 7,292 [2,554]	1 ± 14 [0]	1,324 ± 4,244 [469]	1 ± 7 [0]
Antidepressant pharmacy costs	17 ± 65 [0]	1 ± 10 [0]	18 ± 58 [0]	1 ± 6 [0]
Depression-related medical costs^c	4,438 ± 7,288 [2,552]	0 ± 10 [0]	1,306 ± 4,243 [462]	0 ± 4 [0]
Inpatient visits	3,109 ± 6,648 [617]	0 ± 0 [0]	883 ± 3,937 [143]	0 ± 0 [0]
ED visits	759 ± 1,855 [0]	0 ± 0 [0]	210 ± 1,065 [0]	0 ± 0 [0]
Outpatient costs	426 ± 1,511 [0]	0 ± 10 [0]	165 ± 563 [15]	0 ± 4 [0]
Other costs	144 ± 1,000 [0]	0 ± 0 [0]	49 ± 466 [0]	0 ± 0 [0]

Abbreviations: ED = emergency department; MDD = major depressive disorder; MDSI = major depressive disorder with acute suicidal ideation or behavior; SD = standard deviation

Notes:

- Behavioral and mental health-related medical costs were identified based on claims with an ICD-10-CM diagnosis between F01 and F99 (inclusive).
- Psychiatric pharmacy costs included the following classes of agents: antidepressants, anticonvulsants, antipsychotics, benzodiazepines, lithium, miscellaneous treatments used for ADHD, non-benzodiazepine GABA-receptor modulators (i.e., busiprone), psychostimulants, sleep aids and thyroid hormones.
- Depression-related medical costs were identified based on claims with an ICD-10-CM diagnosis codes: F32.X, F33X, F34.1, F43.21.